The Insect Collectors' Code

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Why do we collect insects? Each fall we pose this question to students enrolled in Insect Biodiversity and Evolution (ENT 432), a core course for the entomology program at Penn State. As with most courses that cover insect taxonomy—spanning dozens of departments, across many generations of entomologists—students are expected to journey into the field, capture and euthanize insects, prepare high-quality, well-labeled specimens, and identify them. The time-honored tradition of building an insect collection remains, as one colleague at a recent ESA annual meeting described, the ultimate immersive, experiential learning exercise for entomologists-in-training. Our students tend to agree. They frequently acknowledge the value of specimens as data, the importance of vouchers, and the myriad ways natural history collections facilitate education, outreach, and research. Collections themselves appear to be uncontroversial and easy to discuss.

With their brains primed for critical thinking and creativity, we then extend the dialog to the ethics of collecting. Can one collect without a permit? Do insects feel pain? Should we worry about over-collecting? Based on our students' responses, we suspect this topic is not discussed enough in entomology. One student eventually asked if there was an oath or a code of ethics for collecting insects. The answer is complicated.

Societies built around taxa that are popular with amateur collectors, for example the Lepidopterists' Society Executive Council (1996) and the Dragonfly Society of the Americas (1996), have statements that guide the collection of those insects. Invertebrate Link (formerly the Joint Committee for the Conservation of British Invertebrates) has also published fairly comprehensive guidelines for invertebrate collectors in the UK (Invertebrate Link (Joint Committee for the Conservation of British Invertebrates), 2002). However, there does not seem to be a universally recognized code that concisely encompasses the collection of insects in general. (Although the ESA clearly recognizes the importance of maintaining natural history collections (Entomological Society of America, 2016), the Society does not appear to have guidelines for insect collectors.)

Also, while the codes above all include clauses on getting permits/permission, minimizing impacts on the environment, and more, they do not explicitly address concerns about treating insects humanely, treating colleagues with respect, creating false data, nor safely handling killing agents and preservatives—all of which are issues we have had to engage as instructors. The class consensus was that there should be a compendium, or oath, that raises awareness of collection issues and sets entomologists on a path towards ethical collecting.

Codes of ethics play increasingly valuable roles in guiding professional responsibilities. The Hippocratic Oath taken by medical doctors is one of the most well-known examples. Less than 25% of medical schools in the United States and Canada used an oath in 1928 (Carey, 1928), but by 1993 the percentage of medical schools whose students pledged an oath was 80% in Canada and 100% in the United States (Orr et al., 1997). There was also an increase in codes of ethics used by corporations during this time period. In the 1950s and 1960s, only 15-40% of businesses surveyed had codes of ethics (Fulmer, 1969) whereas by the early 1990s, 91% of corporations had a code of ethics in place, and 80% of these corporations had sanctions in place to enforce them (Murphy, 1995). Potential reasons for these increases range from the moral to the legal—what better way to respond to criticisms about unethical business practices than to create a code of ethics (Murphy, 1995)? There have also been several recent calls for more codes of ethics in science, for example covering dual purpose research (Revill and Dando, 2006; Selgelid, 2009), open science (Aleksic et al., 2015), and the life sciences more generally (Jones, 2007; Rotblat, 1999; Rappert, 2004).

But are codes of ethics effective? In the business world, there seem to be conflicting findings. One early empirical study found only a 3% difference in decision-making between groups with and without guidance from an ethical code (Ford et al., 1982). Another study concluded that corporate codes of ethics did not influence ethical decisions made by business students (Cleek and Leonard, 1998). However, a different study found that having an ethics policy within an organization did significantly deter unethical behavior (Hegarty and Sims, 1979). More recently, researchers found that the presence of a code of ethics did have an impact on ethical behavior and perceptions of ethics in respondents surveyed, and that employees in companies with a code of ethics reported more encouragement to engage in ethical behavior, as well as higher rates of satisfaction in the resolution of ethical dilemmas they had faced (Adams et al., 2001). And to venture from the realm of business to academia, the findings of (McCabe et al., 1999) suggest that honor codes in United States colleges and universities do have an effect on curbing academic dishonesty.

We drafted a short but relatively inclusive code for collecting insects that we modeled on the modern version of the Hippocratic Oath written by Louis Lasagna in 1964 (Tyson, 2001) and then refined based on the codes mentioned above as well as other resources (*e.g.*, Clancy et al. (2014); Sikes and Gannon (2011); Millar et al. (2000)). The first draft was posted publicly for comment on the Frost Curator's blog (Deans, 2016b) and was sent to members of the Entomological Collections Network for comments (Deans, 2016a). The following revised version of the Insect Collectors' Code was incorporated into the ENT

432 curriculum last fall (2016):

I strive to fulfill, to the best of my ability, the following ideals:

- I will respect the hard-won scientific gains of those entomologists in whose steps I walk and gladly share my scientific gains and knowledge with those who are to follow.
- I will aid in the dissemination of scientific knowledge, both to those who study insects and those who do not.
- I will not discriminate against others, and I will strive to create a safe working environment, whether in the field, the classroom, or the lab.
- I will treat insects humanely. As a collector, it is within my power to take insect life; I will not take insects that will not be deposited in a natural history collection or otherwise made available for research and education. While bycatch is often unavoidable, I will, to the best of my ability, attempt to reduce the unnecessary loss of insect life and find use for these specimens.
- I will consider the ecological impact of removing insects and their products (galls, nests, etc.) from the environment when collecting, whether the species are protected by law, known to be declining, or are considered to be of least concern. I will strive to avoid or minimize disturbance to the environment.
- I will secure appropriate permits and permission prior to collecting insects, and I will honor and uphold the provisions stated by each permit. I will keep copies of all permits on my person while collecting and furnish them to authorized agents upon request. I will save all permits associated with specimens as proof that they were collected legally.
- I will keep detailed field notes of my collecting activities and will make these available to the greater scientific community.
- I will prepare and label specimens according to standards established by professional entomologists who work with collections.
- I will properly store all specimens under my care, and I will not allow specimens to become damaged or degraded through neglect.
- I will properly use and dispose of preservatives, killing agents, and other chemicals associated with specimen collection and preparation. I will never use these chemicals to harm myself or others.
- I will make arrangements for any personal specimens or collections in my possession to be deposited in a museum in the event of my untimely death.
- I will not create false data.

May I always act so as to preserve the finest traditions of natural history, and so long as I uphold these traditions and the stated ideals, may I long experience the joy of my contributions to the furthering of scientific knowledge.

It's too early to know if our administration of this code and our subsequent class discussions of the issues will effect ethical collecting, at least beyond prior expectations. However, we are encouraged by the supportive comments from our colleagues and the sincerity and attention given to the Code by our students. By exposing students to such a code—deliberately written in the first person, as an oath (see Sulmasy (1999) and references therein)—we intend to instill these values in our students. We hope that the lessons they learn in class will make a lasting impact on their education, and that they will carry these ideas with them as they continue pursue their own research and careers, whether or not it brings them back into the field for collecting.

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